# COLLISION REPAIR: PAINTING AND REFINISHING

## COURSE DESCRIPTION

*Collision Repair: Painting and Refinishing* is a course that prepares students to use plastics and adhesives in the repair and refinish processes and to apply automotive paint to a vehicle. Students learn to diagnose automotive paint finish problems and to perform the appropriate manufacturer-required techniques and processes to refinish the affected area or the complete vehicle. Course content provides the student with training in mixing, matching, and applying paint and finish to vehicles. Course content includes the application of plastics and adhesives in the repair and refinish processes. The course prepares students for entry level employment and advanced training in collision repair technology, and post secondary education. Students completing the *Collision Repair: Painting and Refinishing* are eligible to take the ASE written examination for Paint and Refinish and for Plastics and Adhesives.

**Prerequisite(s):** Transportation Core

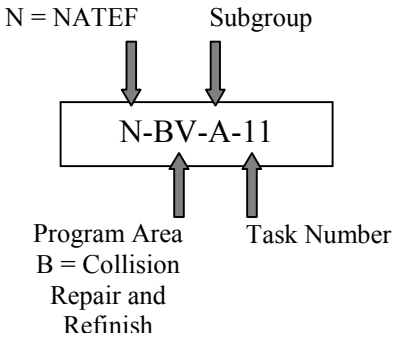
Algebra I or Math for Technology II; Physical Science or Principles of Technology I, (may be concurrent)

**Requirements:** A minimum of 340 hours must be dedicated to in Painting and Refinishing and a minimum of 30 hours must be dedicated to Plastics and Adhesives to meet minimum standards set by NATEF.

**Recommended Credits:** 3

**Recommended Grade Level(s):** 11 or 12

**Notes:** Course is aligned with NATEF tasks list for Collision Repair and Refinish - Painting and Refinishing and for Plastics and Adhesives. Items have been organized based on the requirements of the state-required course description format. NATEF tasks are referenced with the corresponding Performance Standards. Codes are as follows:



# COLLISION REPAIR: PAINTING AND REFINISHING

1.0 Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

2.0 Students will demonstrate general painting and refinishing technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for a collision repair and refinish - painting and refinishing facility.

3.0 Students will apply mathematics and science concepts to collision repair and refinish technology.

4.0 Students will follow proper procedures for preparing vehicles for repainting and refinishing.

5.0 Students will properly mix, match, and apply paint and finish and diagnose and correct paint defects.

6.0 Students will demonstrate proper procedures for applying plastics and adhesives.

7.0 Students will demonstrate communication skills required in the repair and refinish industry.

8.0 Students will demonstrate interpersonal and employability skills required in the collision repair and refinish industry.

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 1.0

Students will demonstrate leadership, citizenship, and teamwork skills required for success in the school, community, and workplace.

LEARNING EXPECTATIONS

The student will:
1.1 Demonstrate positive leadership skills in the classroom and community.
1.2 Participate in SkillsUSA-VICA as an integral part of classroom instruction.
1.3 Investigate how technology has made an impact on the paint and refinish industry in the past 2 years.
1.4 Construct a job search network.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
1.1 Serves as a volunteer in the community.
1.2.A Applies the points of the creed to personal and professional situations.
1.2.B Assists with an officer campaign with Tennessee SkillsUSA-VICA.
1.3.A Writes a technical report that shows technological advancements in engine performance.
1.4.A Refines employment portfolio.
1.4.B Completes a job search for employment opportunities.
1.4.C Researches job search opportunities through SkillsUSA-VICA.

SAMPLE PERFORMANCE TASKS

- Create a leadership inventory and use it to conduct a personal assessment.
- Participate in various SkillsUSA-VICA programs and/or competitive events.
- Analyze entry-level job skills and demonstrate proficiency in each skill.
- Implement an annual program of work.
- Attend a professional organization meeting.
- Participate in the Community Service competition with SkillsUSA-VICA.
- Places resume on national job search Website with SkillsUSA-VICA at www.skillsusa.org.

INTEGRATION LINKAGES

SkillsUSA-VICA, *Professional Development Program,* SkillsUSA-VICA, Communications and Writing Skills, Teambuilding Skills, Research, Language Arts, Sociology, Psychology, Math, Math for Technology, Applied Communications, Social Studies, Problem Solving, Interpersonal Skills, Employability Skills, Critical-Thinking Skills, SCANS (Secretary's Commission on Achieving Necessary Skills), Chamber of Commerce, Colleges, Universities, Technology Centers, and Employment Agencies

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 2.0

Students will demonstrate general painting and refinishing technology safety practices, including Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) requirements for a collision repair/painting and refinishing facility.

### LEARNING EXPECTATIONS

Students will:

2.1 Determine the safe and correct application for chemicals used in a collision repair/painting and refinishing facility.
2.2 Use protective clothing and safety equipment.
2.3 Use fire protection equipment.
2.4 Follow OSHA and EPA regulations affecting collision repair/painting and refinishing technology.
2.5 Respond to safety communications.

### PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

2.1.A Conforms to federal, state, and local regulations when handling, storing, and disposing of all chemicals used in painting and refinishing.
2.1.B Ensures proper ventilation for chemical use.
2.1.C Locates first aid supplies.
2.2.A Demonstrates proper usage of special safety equipment.
2.2.B Selects and uses the appropriate protective clothing for a given task.
2.2.C Demonstrates the use of eye protection.
2.3.A Distinguishes the proper fire extinguisher for each class of fire.
2.3.B Demonstrates the proper use of a fire extinguisher.
2.4.A Locates regulatory information.
2.4.B Extracts information from Material Safety Data Sheets pertaining to shop chemicals.
2.4.C Complies with relevant regulations and standards.
2.4.D Passes with 100% accuracy a written examination relating specifically to paining and refinishing and plastics and adhesives safety issues.
2.4.E Passes with 100% accuracy a performance examination relating specifically paining and refinishing and plastics and adhesives tools and equipment.
2.4.F Maintains a portfolio record of written safety examinations and equipment examinations for which the student has passed an operational checkout by the instructor.
2.5.A Interprets safety signs and symbols.
2.5.B Complies with safety signs and symbols.
2.5.C Interprets and takes action on manufacturer safety communications.

### SAMPLE PERFORMANCE TASKS

- Assess the work area for safety hazards.
- Design a corrections program for identified hazards.
- Model the appropriate protective equipment for an assigned task.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 3.0

Students will apply mathematics and science concepts to collision repair and refinish technology.

LEARNING EXPECTATIONS

The student will:

3.1 Relate mathematics to painting and refinishing and plastics and adhesives technology.
3.2 Relate chemical concepts to painting and refinishing and plastics and adhesives technology.
3.3 Relate physical properties to painting and refinishing and plastics and adhesives technology.
3.4 Relate physics concepts to painting and refinishing and plastics and adhesives technology.
3.5 Relate optical concepts to painting and refinishing and plastics and adhesives technology.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

3.1.A Determines the appropriate mathematics operation (addition, multiplication, subtraction, or division) for a given situation and mentally arrives at a solution.
3.1.B Performs the following calculations:
- Adds numbers that include decimals to determine conformance with the manufacturer's specifications.
- Mentally adds two or more numbers to determine conformance with the manufacturer's specifications.
- Adds whole numbers to accurately determine measurement conformance with the manufacturer's specifications.
- Divides decimals to determine measurement conformance with the manufacturer's specifications.
- Divides whole numbers to determine differences for comparison with the manufacturer's specifications.
- Multiplies (mentally) numbers that include decimals to determine conformance with the manufacturer's specifications.
- Subtracts whole numbers to determine differences for comparison with the manufacturer's specifications.
- Mentally and in written form subtracts numbers to arrive at a difference for comparison with the manufacturer's specifications.

3.1.C Measures/tests with tools designed for English or metric measurements and then converts the resulting measurement to the system used by the manufacturers for specifying the correct measurement or tolerance.
3.1.D Visually formulates the angle of spray pattern or spray equipment.
3.1.E Interprets symbols to determine compliance with the manufacturer's specifications.
3.2.A Connects the periodic table to the use of chemicals and substances used in painting and refinishing materials use in automobiles.
3.2.B Analyzes the role a catalyst plays to an auto body compound.
3.2.C Examines how a contaminated liquid can cause a chemical reaction, which results in the deterioration of performance.
3.2.D Determines the purpose of adding additives to auto body repair compounds.

3.2.E Evaluates the conductivity problems in a circuit when connectors corrode due to electrochemical reactions.
3.3.A Demonstrates the proper service procedures based on the physical properties of an automobile component or system that are made of glass or plastic.
3.3.B Explores the role that acids and bases have in altering compounds used on or in the automobile.
3.3.C Analyzes the role that activators have in causing a change in the chemical state of a compound or filter.
3.3.D Examines the surface process that occurs on system seals due to absorption of the contained materials.
3.4.A Assesses the characteristics of liquids.
3.4.B Reads and interprets data correctly from measurement tools used in painting and refinishing.

SAMPLE PERFORMANCE TASKS

- Determine a component's measurement conformance with manufacturer's specification.
- Determine compliance with manufacturer's specifications by interpreting symbols.

INTEGRATION LINKAGES

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# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 4.0

Students will follow proper procedures for preparing vehicles for repainting and refinishing.

LEARNING EXPECTATIONS

The student will:
4.1 Follows safety precautions specific to painting and refinishing technology.
4.2 Prepares surfaces for painting and refinishing.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
4.1.A Locates and follows necessary precautions with hazardous operations and materials according to federal, state, and local regulations. N-BV-A-1
4.1.B Interprets safety and personal health hazards according to OSHA guidelines and the "Right to Know Law". N-BV-A-2
4.1.C Inspects spray environment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards. N-BV-A-3
4.1.D Selects and uses the NIOSH approved personal sanding respirator. Inspects condition and ensures fit and operation; performs proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation. N-BV-A-4
4.1.E Selects and uses the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system; performs proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation. N-BV-A-5
4.1.F Selects and uses the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.). N-BV-A-6
4.2.A Performs the following tasks before applying primer:
- Inspects, removes, stores, and replaces exterior trim and molding. N-BV-B-1
- Soaps and water washes entire vehicle; uses appropriate cleaner to remove contaminants. N-BV-B-2
- Inspects and identifies substrate, type of finish and surface condition; develops a plan for refinishing using a total product system. N-BV-B-3
- Removes paint finish. N-BV-B-4
- Dry or wet sands areas to be refinished. N-BV-B-5
- Featheredges broken areas to be refinished. N-BV-B-6
- Removes dust from area to be refinished, including cracks or moldings of adjacent areas. N-BV-B-14
- Cleans area to be refinished using a final cleaning solution. N-BV-B-15
- Removes, with a tack rag, any dust or lint particles from the area to be refinished. N-BV-B-16

4.2.B Follows the following steps to apply primer and filler:
- Applies suitable metal treatment or primer. N-BV-B-7
- Masks trim and protect other areas that will not be refinished. N-BV-B-8
- Mixes primer, primer-surfacer or primer-sealer. N-BV-B-9
- Applies primer onto surface of repaired area. N-BV-B-10
- Applies two-component finishing filler to minor surface imperfections. N-BV-B-11

- Dry or wet sands area to which primer-surfacer has been applied. N-BV-B-12
- Dry sands area to which two-component finishing filler has been applied. N-BV-B-13

4.2.C Applies suitable sealer to the area being refinished when sealing is needed or desirable; scuffs sand to remove nibs or imperfections from a sealer. N-BV-B-17; N-BV-B-18

4.2.D Applies stone chip resistant coating. N-BV-B-19

4.2.E Restores corrosion-resistant coatings, caulking, and seam sealers to repaired areas. N-BV-B-20

4.2.F Prepares adjacent panels for blending. N-BV-B-21

SAMPLE PERFORMANCE TASKS

- Prepare a vehicle for repainting.
- Choose and apply an appropriate filler to a vehicle.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 5.0

Students will properly mix, match, and apply paint and finish and diagnose and correct paint defects.

LEARNING EXPECTATIONS

The student will:

5.1 Operate spray gun and related equipment.
5.2 Correctly mix, match, and apply paint and finish.
5.3 Apply math and science concepts to paint mixing.
5.4 Complete final details.
5.5 Diagnose and correct paint defects.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

5.1.A Inspects, cleans, and determines condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment). N-BV-C-1
5.1.B Checks and adjusts spray gun operation for HVLP (high volume, low pressure) or LVLP (low volume, low pressure) guns. N-BV-C-2
5.1.C Sets up (fluid needle, nozzle, and cap), adjusts, and tests spray gun using fluid, air, and pattern control valves. N-BV-C-3
5.1.D Uses precision gauges or instruments to measure the flow rate of air in a painting application.
5.1.E Determines how variances in flow rate can affect the spray pattern, thickness of coat, etc., in the finishing process.
5.2.A Determines type and color of paint already on vehicle by manufacturer's vehicle information label. N-BV-D-1
5.2.B Shakes, stirs, reduces, catalyzes/activates, and strains paint according to manufacturer's procedures. N-BV-D-2
5.2.C Applies the following:
- Applies the finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. N-BV-D-3
- Applies selected product on test and let-down panel in accordance with manufacturer's recommendations; checks for color match. N-BV-D-4
- Applies single stage topcoat for refinishing. N-BV-D-5
- Applies basecoat/clearcoat for panel blending or partial refinishing. N-BV-D-6
- Applies basecoat/clearcoat for overall refinishing. N-BV-D-7

5.2.D Denibs, buffs, and polishes finishes where necessary. N-BV-D-8
5.2.E Performs the following additional tasks:
- Identifies the types of rigid, semi-rigid or flexible plastic parts to be refinished; determines the materials, preparation, and refinishing procedures. N-BV-D-9
- Refinishes rigid, semi-rigid and flexible plastic parts. N-BV-D-10
- Cleans, conditions and refinishes vinyl (e.g. upholstery, dashes, and tops). N-BV-D-11
- Applies multi-stage (tricoat) coats for panel blending or overall refinishing.

N-BV-D-12

5.2.F Mixes paint including the following steps:
- Identifies and mixes paint using a formula. N-BV-D-13
- Identifies poor hiding colors; determines necessary action. N-BV-D-14
- Tints color using formula to achieve a blendable match. N-BV-D-15
- Identifies alternative color formula to achieve a blendable match. N-BV-D-16

5.3.A Correctly uses proportions and ratios in mixing fillers, finishes, and other substances.

5.3.B Examines the role that pigmentation plays in determining the specific shade of an automotive body or interior color.

5.4.A Applies decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc. N-BV-F-1

5.4.B Buffs and polishes finish to remove defects as required. N-BV-F-2

5.4.C Cleans interior, exterior, and glass. N-BV-F-3

5.4.D Cleans body openings (door jambs & edges, etc.). N-BV-F-4

5.4.E Removes overspray. N-BV-F-5

5.5.A Identifies the following paint defects, determines their cause, and corrects the condition:
- blistering (raising of the paint surface) N-BV-E-1
- blushing (milky or hazy formation) N-BV-E-2
- dry spray appearance in the paint surface N-BV-E-3
- presence of fish-eyes (crater-like openings) in the finish N-BV-E-4
- lifting N-BV-E-5
- clouding (mottling and streaking in metallic finishes) N-BV-E-6
- orange peel N-BV-E-7
- over-spray N-BV-E-8
- solvent popping in freshly painted surface N-BV-E-9
- sags and runs in paint surface N-BV-E-10
- sanding marks (sand scratch swelling) N-BV-E-11
- contour mapping (shrinking and splitting) while finish is drying N-BV-E-12
- color difference (off-shade) N-BV-E-13
- tape tracking N-BV-E-14
- low gloss condition N-BV-E-15
- poor adhesion N-BV-E-16
- paint cracking (crows feet or line-checking, micro-checking, etc.) N-BV-E-17
- rust spots N-BV-E-18
- dirt or dust in the paint surface N-BV-E-19
- water spotting N-BV-E-20
- finish damage caused by bird droppings, tree sap, and other natural causes N-BV-E-21
- finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes) N-BV-E-22
  die-back conditions (dulling of the paint film showing haziness),. N-BV-E-23
- chalking (oxidation) N-BV-E-24
- bleed-through (staining) N-BV-E-25
- pin-holing N-BV-E-26
- buffing-related imperfections (swirl marks, wheel burns) N-BV-E-27
- pigment flotation (color change through film build) N-BV-E-28

5.5.B Measures mil thickness. N-BV-E-29

SAMPLE PERFORMANCE TASKS

- Identify the paint defect on a vehicle and correct problem.
- Mix paint according to a specified formula.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 6.0

Students will demonstrate proper procedures for applying plastics and adhesives.

LEARNING EXPECTATIONS

The student will:
6.1 Prepare for working with plastics and adhesives.
6.2 Perform repairs involving plastics.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:
6.1.A Determines the types of plastics and determines repairability. N-BIV-1
6.1.B Distinguishes the different types of plastics repair procedures. N-BIV-2
6.1.C Cleans and prepares the surface of plastic parts. N-BIV-2
6.1.D Prepares repaired areas for refinishing. N-BIV-9
6.2.A Repairs plastic parts by welding. N-BIV-3
6.2.B Repairs plastic parts with urethane or epoxy adhesives, using reinforcements if necessary. N-BIV-4
6.2.C Repairs holes and cuts in rigid and flexible plastic parts using backing materials and adhesives. N-BIV-5
6.2.D Retextures plastic parts. N-BIV-6
6.2.E Removes damaged areas from rigid exterior sheet-molded compound (SMC) panels and repairs with partial panel. N-BIV-7
6.2.F Replaces bonded sheet-molded compound (SMC) body panels; straightens or aligns panel supports. N-BIV-8

SAMPLE PERFORMANCE TASKS

- Use a diagnostic strategy to determine repairability of plastics on a damaged vehicle.
- Determine the appropriate procedure for repairing damaged plastic on a vehicle and safely and correctly perform the repair using adhesives, welding techniques, or backing materials as appropriate.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 7.0

Students will demonstrate communication skills required in the repair and refinish industry.

LEARNING EXPECTATIONS

The student will:

7.1 Communicate and comprehend oral and written information typically occurring in the automotive collision repair/painting and refinishing workplace.

7.2 Solve painting and refinishing and plastics and adhesives problems and make decisions using a logical process.

7.3 Use teamwork skills to accomplish goals, solve problems, and manage conflict within groups.

PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

7.1.A Interprets and uses written information in common job formats, such as tables, charts, and reference materials and manuals relating to painting and refinishing and plastics and adhesives.

7.1.B Interprets and uses graphical information such as blueprints, electrical schematics, process control schematics, flow diagrams, and other diagrams.

7.1.C Uses electronic resources to obtain information relating to painting and refinishing and plastics and adhesives.

7.1.D Analyzes information obtained form various sources to determine a diagnostic approach.

7.1.E Communicates clearly and appropriately in oral and written form.

7.2.A Develops a hypothesis regarding the cause of a paint defect.

7.2.B Tests the hypothesis to determine the solution to the paint defect.

7.2.C Creates, evaluates, and revises as needed a plan to resolve a paint defect.

7.3.A Serves in each of the functional roles of a team.

7.3.B Resolves conflicts within a group.

7.3.C Demonstrates appropriate and positive examples of giving and accepting criticism.

7.3.D Modifies behavior or revises work based on appropriate criticism.

7.3.E Solves problems in cooperation with other members of a group.

7.3.F Evaluates the role of the painting and refinishing technician within the organizational system.

SAMPLE PERFORMANCE TASKS

- Use reference materials to determine procedures for painting and refinishing.
- Work as a team member to develop an analytical strategy.

INTEGRATION LINKAGES

Math, Science, Chemistry, Physics, Communication Skills, Teamwork Skills, Reading Skills, Leadership Skills, Problem Solving and Critical Thinking Skills, computer Skills, Art and Design, Computer Aided Design, Secretary's Commission on Achieving Necessary Skills (SCANS), National Institute for Automotive Service Excellence, (ASE) National Automotive Technician Education Foundation (NATEF), Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), SkillsUSA-VICA

# COLLISION REPAIR: PAINTING AND REFINISHING

## STANDARD 8.0

Students will demonstrate interpersonal and employability skills required in the collision repair and refinish industry.

### LEARNING EXPECTATIONS

The student will:

8.1 Evaluate career goals and establish long-term goals.
8.2 Demonstrate attitudes conducive to workplace success.
8.3 Maintain a neat and orderly work area.
8.4 Assess implications of diversity for communities, workplaces, and manufacturers.
8.5 Develop personal financial skills.
8.6 Develop individual time management and work sequencing skills relating to painting and refinishing and adhesives and plastics.

### PERFORMANCE STANDARDS: EVIDENCE STANDARD IS MET

The student:

8.1.A Explores opportunities for advanced training.
8.1.B Assesses the potential impact of an individual's educational level on an organizational system.
8.1.C Infers the relationship between work ethics, education, and personal job success.
8.2.A Judges which attitudes and behaviors are conducive to success.
8.2.B Models customer service skills.
8.3.A Keeps work area organized and free from clutter according to NATEF and OSHA standards.
8.3.B Deduces the correlation between a clean orderly work environment and successful and efficient job performance and earnings.
8.4.A Points out potential benefits and problems that may arise from diversity in the collision repair and refinish service workplace, including manufacturer diversity.
8.4.B Devises solutions to problems arising from gender, cultural, racial, and religious diversity.
8.5.A Develops a personal budget.
8.5.B Sets personal financial goals.
8.6 Displays time management and work sequencing skills in class assignments and work assignments.

### SAMPLE PERFORMANCE TASKS

- Maintain an orderly work area.
- Consistently arrive at class on time.
- Participate in an internship in a dealership or fleet shop.
- Resolve an interpersonal conflict in the classroom.

INTEGRATION LINKAGES

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# COLLISION REPAIR: PAINTING AND REFINISHING

SAMPLING OF AVAILABLE RESOURCES

*Enhanced Delivery I-Car Curriculum*, I-CAR

*Auto Collision Curriculum Guide,* Instructional Materials Laboratory (IML), University of Missouri

*Professional Automotive Collision Repair*, 2nd Ed, Duffy, Delmar Publishing

*Auto Body Repairing and Refinishing,* Goodheart-Willcox, 2000.

Teacher Web resources:

Math/Science Web Site http://enc.org

National Science Teachers Association http://www.nsta.org/store

Center for Occupational Research and Development (CORD) http://www.cord.org/

Delmar International Thomson Learning http://www.delmar.com/

University of Missouri Instructional Materials Lab (IML)
http://www.iml.coe.missouri.edu/

Oklahoma Curriculum Instructional Materials Center (CIMC)
http://www.okvotech.org/cimc/home.htm